National Institute of Environmental Health Sciences

Zoonoses and climate variability. The example of leishmaniasis in southern departments of Colombia

Author(s):	Cardenas R, Sandoval CM, Rodriguez-Morales AJ, Vivas P
Book:	Animal Biodiversity and Emerging Diseases: Prediction and Prevention
Year:	2008
Series:	Annals of the New York Academy of Sciences, 1149
Publisher:	Blackwell Publishing (Oxford, England)

Abstract:

Leishmaniasis in the Americas is transmitted by Lutzomyia spp., which have many animal reservoirs. Previous studies indicated potential changes in vectors of climate-related distribution, but impact outcomes need to be further studied. We report climatic and El Nino events during 1985-2002 that may have had an impact on leishmaniasis in 11 southern departments of Colombia: Amazonas, Caqueta, Cauca (Ca), Huila, Meta (Mt), Narino, Putumayo (Py), Tolima, Valle (Va), Vaupes (Vp), and Vichada. Climatic data were obtained by satellite and epidemiologic data were obtained from the Health Ministry. NOAA climatic classification and SOI/ONI indexes were used as indicators of global climate variability. Yearly variation comparisons and median trend deviations were made for disease incidence and climatic variability. During this period there was considerable climatic variability, with a strong El Nino for 6 years and a strong La Nina for 8. During this period, 19,212 cases of leishmaniasis were registered, for a mean of 4756.83 cases/year. Disease in the whole region increased (mean of 4.98%) during the El Nino years in comparison to the La Nina years, but there were differences between departments with increases during El Nino (Mt 6.95%, Vp 4.84%), but the rest showed an increase during La Nina (1.61%-64.41%). Differences were significant in Va (P = 0.0092), Py (P = 0.0001), Ca (P = 0.0313), and for the whole region (P = 0.0023), but not in the rest of the departments. The importance of climate change is shown by shifts in insect and animal distributions. These data reflect the importance of climate on transmission of leishmaniasis and open further investigations related to forecasting and monitoring systems, where understanding the relationship between zoonoses and climate variability could help to improve the management of these emerging and reemerging diseases.

Source: http://dx.doi.org/10.1196/annals.1428.094
http://onlinelibrary.wiley.com/doi/10.1196/annals.1428.094/abstract

Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, El Nino Southern Oscillation, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Central/South America

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Fly-borne Disease

Fly-borne Disease: Leishmaniasis

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content